able variation. Although many forms are recorded in Europe, only *tenebrosa* has been recognized here. Environment seems to be the governing factor, *tenebrosa* usually frequenting the marshes and the other forms the rocks, often far above the high water mark. They vary in color to a great extent according to the color of the rocks they frequent. At Bass Rocks, Gloucester, Mass., in algae at about half tide is a colony scarlet in color.

Where conditions are as diversified as in New England maps showing the distribution of certain species will be found very useful and instructive.

ISOLATION AND CURACAO

BY H. BURRINGTON BAKER

Those of us who were initiated into the mysteries and delights of conchology through our interest in a local fauna of eastern or central United States, or of any continental land mass where the barriers are few and far between, find it difficult, at first, to realize the necessity for exact localities. Although we may find a certain species in a woodlot but absent from the adjacent cedar swamp, we soon recognize that this restriction is purely edaphic and ecological. Under similar conditions, the same forms usually turn up over and over again, even if we travel miles away from the region of our first acquaintance with our sluggish and secretive favorites. Once in a long time, we may come across such exceedingly exclusive eremites as *Hendersonia occulta* (Helicinidae), which, for example, occurs abundantly in the deep limestone gorge at the base of the Virginian Natural Bridge, but is quite absent from the rich forests of the surrounding hills, just as it is from most parts of its remarkably discontinuous range. However, such cases are exceptional, and usually the notation of exact localities does seem almost a waste of time and space.

As a result, we are apt to be totally unprepared for the amazing segregation that occurs in regions where the barriers are numerous and relatively impassable. Even if we have followed

the intensive explorations of Pilsbry and Ferriss in southwestern United States, or have read accounts of such a conchologist's paradise as the Hawaiian Islands, we scarcely are in a position to visualize the almost complete change of fauna that may occur in a few miles, or even in a few yards. At least, I must confess that the actuality of isolation came almost as a distinct shock, when I sauntered out of Willemstad, Curaçao, in 1920, and found a molluscan fauna that was almost totally distinct from that which I had been studying in Venezuela, only forty-odd miles away. And, even then, I was unable to prognosticate what I observed in 1922, the extremely limited distribution of some of the forms from these Dutch West Indies.

As has been described in a previous paper (1924, Occ. P. Mus. Zool. Univ. Mich., no. 152), each of these islands consists of a core of older igneous and metamorphosed strata surrounded by an irregular zone of coral rock. Many of the shells, especially those of the genus *Tudora*, are more or less limited to the limestone rim; as this is broken in many places, especially on Curaçao, by narrow arms of the sea, we get a series of colonies with relatively impassable barriers between them. In addition, the semidesert climate of the islands is only relieved by comparatively brief periods of rainfall, so that the snails are forced to spend most of their lives in a quiescent state. Both of these factors tend to discourage migration, and, coincident with this, we find rapid changes in the facies of the shells within surprizingly short distances; in fact, colonies of *Tudora* which are separated by two or three of the more decided breaks in the shore line show scarcely an intergradient individual. Even more striking is the case of *Tudora pilsbryi*, which is practically limited to the talus below the escarpments of a single monadnock, where it completely replaces the more widespread *T. megacheilos*.

Such a region can only be studied by a conchologist in the field, and even he will have difficulty, as I did, until be realizes the absolute necessity for the careful segregation of the lots from each limited locality. Anyone not especially interested in snails will fail to recognize the need of such intensive analysis,

and a random collection will show only a part of the actual isolation of divergent colonies. Besides, as already indicated, even a conchologist who is not familiar with this type of distribution is slow to comprehend the verity of its occurrence.

In his useful paper "On a Collection of Non-Marine Mollusca from Curaçao" (1925, Bijd. Dierk. Kon. Zoöl. Gen. Amsterdam, Afl. XXIV, 25–32), Tera van Benthem Jutting labors under the load of both these impediments. The limited collection that he describes was picked up in central Curaçao by scientists who were not especially concerned about the mollusks alone. Besides, I venture to suspect van Benthem Jutting himself is more familiar with the widespread fauna of western Europe than with the localized ones of the arid tropics. As a result, his paper contains certain records which I am quite sure are based on misconceptions, and a brief discussion of some of these citations may not be out of order.

Cerion uva (L.). Although a random lot would indicate that *C. u. diablensis* and *C. u. hatoensis* "only denote the extreme limits of variation", it is also true that the mean diameter of specimens from the type locality of the former falls outside the total range of variation in individuals from the typical colony of the latter (see table XII of my paper).

Brachypodella raveni (Crosse). "Tafelberg" is often used by the inhabitants of Curaçao to denote vaguely the southeastern end of the island; as will be shown later, I feel sure that van Benthem Jutting has no shells from the bases of the escarpments of the Tafelberg of Santa Barbara itself. On this account, it is no wonder that he is unable to recognize my subspecies *sanctaebarbarae;* all of his specimens came from localities where only typical *raveni* would be expected.

Microceramus bonairensis curacoanus H. B. B. The subspecific name is not "*curaçaoana.*"

Opeas gracile (Hutton). Doubtlessly an introduced species on cultivated ground.

Pupoides marginatus nitidulus (Pfr.). Cited as "*Pupa (Pupoides) manginata* (Say)". Of course, *Pupa* cannot be used for any Pupillid; if Roeding's "Museum Boltenianum" is rejected, as it certainly should be, *Pupa* will replace *Cerion.*

Succinea barbadensis Gldg. and *S. gyrata* Gibbons. Although I recognized two forms in my poor material, collected during the dry season, I am still skeptical as to their specific separation. Van Benthem Jutting's excellent figures will be of great assistance to that very courageous individual who may attempt, some time in the future, the anatomical studies that will be necessary before we can make any definite statements about the West Indian members of this genus.

Physa cubensis Pfr. An interesting addition to the fauna. However, I would not be inclined to use any freshwater pulmonate that can withstand the dessication of semidesert conditions as an indicator of zoögeographical affinities; *Planorbis pallidus*, at least, certainly enjoys extraordinary means of dispersal, as I found it in a raised cement tank which received its water from a closed well, through the agency of a windmill. Perhaps both of these shells should be classed as "occasional migrants", along with the birds that probably transport them.

Tudora rupis H. B. B. Either a mistaken identification or an error in locality; this species does not occur anywhere in the vicinity of Hato.

Tudora megacheilos (P. & M.). From the localities, most of the specimens would belong to the typical subspecies, although I would expect *kabrietensis* from the vicinity of the Tafelberg. If any of van Benthem Jutting's shells had come from the escarpments of the Tafelberg of Santa Barbara itself, they would have certainly included *T. pilsbryi*, a very distinct and conspicuous species.

Tudora fossor H. B. B. Van Benthem Jutting cites 21 specimens of *Tudora* s. S. from Hato; 10 of these are included under *T. megacheilos*, 11 under *T. fossor*. The latter occurs nowhere in the vicinity of this locality, where the shells are intermediate between typical *megacheilos* and the subspecies *rondeklipensis*, which does somewhat approach the distinct species from northern Curaçao.

Cistulops raveni (Crosse)! The citation of this species from "Tafelberg" furnishes additional proof that the lots so labeled did not come from the escarpments of the Tafelberg of Santa Barbara. Attention is called to the presence of another "Tafel-

berg", that of Sint Hyronimus, in the northern region of Curaçao; in fact, most of the coral-capped monadnocks of the southwestern coast are small "table-mountains".

In conclusion, I may be excused if I diverge considerably from the field of conchology to mention another interesting effect of past isolation on Curaçao. The prevailing language of this island, Bonaire and Aruba is Papiamento, which is only spoken by the natives of this group. The name itself may be roughly translated as "Much talk" or "Art of talking"; it is also called "Spaansch", because many of its users truly believe that it is the original Spanish. Actually, it probably started as a simplified slave-dialect of Portuguese, but it has acquired words from all of the tongues spoken in the West Indies and is characterized by a lack of conjugations, tenses and abstract terms, which makes it strikingly different from the Romance languages. Another peculiarity, which it possesses in common with some primitive languages, is the introduction of each verb by a syllable, pronounced "ta", which simply indicates that the next word will be this part of speech. However, the prospective collectors in Curaçao need not be deterred by any question of a common language, as English is widely spoken and understood in the islands; in fact, the natives, starting with the limited Papiamento, seem to have a propensity to acquire smatterings of several languages, without the ability to express a complicated idea in any of them.

THE TYPE OF ANCYLASTRUM BOURGUIGNAT

BY H. BURRINGTON BAKER

Kennard and Woodward (1925, Naut. XXXVII, p. 83) have recently re-opened the question of the type of *Ancylastrum* Bgt. (Feb. 15, 1853, J. de C. IV, 60, 63) and the validity of *Pseudancylus* Walker (1921, Naut. XXXV. 58). They come to the conclusion that the type of the former is *Ancylus fluviatilis* Müller, while Walker (1921, 5–9) had decided that it was *Ancylus cumingianus* Bgt. (either May 1, 1853, J. de C. IV, 170; or July 25, 1854, P. Z. S., 91).